CHRISNEY LAKE

Spencer County

2005 Fish Management Report

Daniel P. Carnahan
Fisheries Biologist

Fisheries Section
Indiana Department of Natural Resources
Division of Fish and Wildlife
I.G.C.-South, Room W273
402 W. Washington Street
Indianapolis, IN 46204

2006

EXECUTIVE SUMMARY

- Chrisney Lake is a shallow impoundment constructed in 1960 and is located 0.5 mi east of the Town of Chrisney. Angler access is good with a concrete boat ramp and 60% of the shoreline being available for bank fishing. A golf course on the west side of the lake encompasses about 35% of the shoreline.

- A standard fisheries survey was conducted on June 6 and 7, 2005. An aquatic vegetation survey was conducted on July 25.

- Chrisney Lake's fishery has undergone substantial changes since the 1993 fisheries survey. The gizzard shad population has increased in relative abundance by number from less than 1% to 27% and is now only outranked by bluegill. The overall largemouth bass abundance has decreased, but the proportion of bass over 12.0 in has increased. No redear sunfish were sampled in 1993 and they are now a major contributor to the fishery. Black crappie abundance has tripled.

- The district fisheries biologist should provide the Town of Chrisney with more largemouth bass minimum length limit signs and inform the Spencer County conservation officer of the perceived harvest of undersized bass.

- The Division of Fish and Wildlife should continue the biennial stocking of 160, 8.0 to 10.0 in channel catfish.

- The Town of Chrisney should submit a sediment removal plan to the Division of Fish and Wildlife's Lake and River Enhancement biologist.

- A fisheries renovation should be conducted if the lake is dredged.

INTRODUCTION

Chrisney Lake is a 19.4-acre impoundment built in 1960 and is located 0.5 mi east of the Town of Chrisney. The lake previously served as Chrisney's public water supply. Angler access is good. A concrete boat ramp is located near the dam and 60% of the shoreline is available for bank fishing. There are no fees associated with fishing or accessing the lake. A golf course on the west side of the lake encompasses about 35% of the shoreline.

The only previous fisheries survey was conducted in 1993. That survey concluded that the lake possessed good bluegill fishing and poor bass fishing. The bluegill population had a good proportion of bluegill greater than 6.0 in, while no bass greater than 12.0 in were sampled. It was assumed that the absence of bass greater than 14.0 in was due to the illegal harvest of bass less than 14.0 in. Also, a low-level gizzard shad population was present and no redear sunfish were sampled. It was recommended that the Division of Fish and Wildlife (DFW) stock 160, 8 to 10 in channel catfish biennially since no channel catfish were sampled during the survey. The DFW has been stocking the lake with channel catfish since 1995. Leafy pondweed was the predominant aquatic plant and it was estimated to cover approximately 15% of the lake's bottom.

METHODS

The standard fisheries survey was conducted on June 6 and 7, 2005 and the aquatic vegetation survey was conducted on July 25. These surveys were conducted under DFW work plan 202478. Some physical and chemical characteristics of the water were measured according to DFW guidelines (2001). The aquatic vegetation survey was conducted as described by Pearson (2004). A GPS device was used to record all sampling locations.

All fish sampling was completed according to the standard sampling guidelines. Fish sampling effort consisted of 0.5 h of pulsed DC night electrofishing with two dippers, one trap net lift, and two experimental-mesh gill net lifts. All fish were measured to the nearest 0.1 in TL. Average weights for fish by half-inch groups for Fish Management District 7 were used to estimate the weight of all fish. Scale samples were taken from a subsample of game fish for age and growth analysis. Proportional stock density (PSD) and relative stock density (RSD) indices were used to evaluate the largemouth bass and bluegill populations (Anderson and Neumann 1996). The bluegill fishing potential index (BGFP) was used to evaluate the quality of the

bluegill fishing (Ball and Tousignant 1996).

RESULTS

Chrisney Lake is a shallow lake with a maximum depth of 11.0 ft. The lake was turbid with a Secchi disk measurement of 3.0 ft. Dissolved oxygen was sufficient for fish survival to a depth of 6.0 ft. The lake was at normal pool during the surveys.

Aquatic vegetation was found to a depth of 7.0 ft and 25 of the 27 littoral depth sampling sites possessed some amount of vegetation. The overall mean rake score was 2.70. Chara was the predominant plant found with a mean rake score of 2.44. Other plants surveyed were Eurasian watermilfoil and naiad spp. Emergent aquatic plants observed were cattail spp. and creeping water primrose.

A total of 1,395 fish, representing nine species, was sampled that weighed 210.43 lbs. Bluegill ranked first by number followed by gizzard shad, redear sunfish, and largemouth bass. Gizzard shad ranked first by weight followed by bluegill, largemouth bass, and redear sunfish. Other species sampled were black crappie, warmouth, yellow bullhead, channel catfish, and golden shiner. Warmouth, yellow bullhead, channel catfish, and golden shiner combined for less than 2% of the collection by number and 3% by weight.

A total of 749 bluegill was sampled that weighed 35.40 lbs. They ranged in length from 1.6 to 8.0 in. Bluegill accounted for 54% of the sample by number and 17% by weight. In 1993, the relative abundance was 79% by number and 34% by weight. Catch rates by gear type were 1,384.0/electrofishing h, 3.0/gill net lift, and 51.0/trap net lift. Previous catch rates (excluding age-0 bluegill) were 1,564.0/electrofishing h, 2.7/gill net lift, and 41.3/trap net lift. Bluegill growth was average compared to the district's average and similar to 1993 results.

The bluegill PSD decreased from 45 (1993) to 6. The RSD7 and RSD8 values have also decreased from 28 and 2 to 1 and 0. The BGFP rated bluegill fishing as excellent in 1993 with a score of 26 (maximum is 40) and marginal in 2005 with a score of 12.

A total of 381 gizzard shad was sampled that weighed 106.60 lbs. They ranged in length from 6.0 to 14.9 in. Gizzard shad accounted for 27% of the sample by number and 51% by weight. Twelve shad were sampled in 1993 that accounted for less than 1% of the sample by number and 5% by weight. Gizzard shad catch rates were 330.0/electrofishing h, 106.5/gill net

lift, and 6.0/trap net lift.

A total of 112 redear sunfish was sampled that weighed 21.65 lbs. They ranged in length from 4.3 to 8.4 in. Redear accounted for 8% of the sample by number and 10% by weight. No redear sunfish was sampled in 1993. Redear sunfish catch rates were 212.0/electrofishing h, 3.0/gill net lift, and no redear were caught in trap nets. Redear growth was average when compared to the district's average.

Eighty-seven largemouth bass were sampled that weighed 32.07 lbs. They ranged in length from 1.5 to 17.9 in. Largemouth bass relative abundance was 6% by number and 15% by weight. The 1993 relative abundance was 15% by number and 40% by weight. The bass electrofishing catch rate (excluding age-0 bass) decreased from 264.0 to 170.0/h. The gill net catch rate was 1.0/lift and no bass were captured in trap nets. Largemouth bass growth was average and similar to 1993 results. The maximum length at capture by age was 6.9 in for age 1, 11.0 in for age 2, 13.7 in for age 3, no age-4 bass were sampled, 15.0 in at age 5, and 17.9 in at age 6. The largemouth bass PSD increased from 0 (1993) to 23. The RSD14 was 7.

Forty-one black crappie were sampled that weighed 7.80 lbs. They ranged in length from 4.4 to 10.1 in. Black crappie relative abundance increased from less than 1% by number and weight in 1993 to 3% by number and 4% by weight. Only five black crappie were sampled in 1993. Black crappie catch rates were 8.0/electrofishing h, 15.0/gill net lift, and 7.0/trap net lift. Growth was average when compared to the district's average.

DISCUSSION

Chrisney Lake's fishery has undergone substantial changes since the 1993 fisheries survey. The gizzard shad population increased in relative abundance by number from less than 1% to 27% and is now only outranked by bluegill. The bluegill population's size structure has diminished. The overall largemouth bass abundance has decreased, but the proportion of bass over 12.0 in has increased. No redear sunfish were sampled in 1993 and they are now a major contributor to the fishery. Black crappie abundance has tripled.

The bluegill fishery has changed from an excellent to a marginal fishery as identified by the decreasing stock density indices and BGFP. This is due to the presence of a large gizzard shad population. Gizzard shad compete with bluegill for food, negatively affecting the bluegill

population's size structure. The result of this competition is a bluegill population dominated by small, slow growing fish.

The proportion of larger bass in the fishery has improved since 1993. No 12.0 in and larger bass was sampled in 1993; now the bass population has a PSD of 23 and an RSD14 of 7. These are vast improvements in the population's size structure, but with the current forage base and growth, the PSD and RSD14 values should be much higher. The only explanation for the lack of more bass over 10.0 in long is illegal harvest of undersize bass. At least three cases were made by conservation officers for anglers harvesting undersize bass in 2005 that the district fisheries biologist is aware of. If the 14-in minimum length limit is adhered to, the lake has the potential to produce larger bass. The district fisheries biologist should provide the Town of Chrisney with more largemouth bass minimum length limit signs and inform the Spencer County conservation officer of the perceived harvest of undersized bass.

The black crappie population has increased due to the decreased predation from largemouth bass. Bass predation has decreased due to the reduced bass numbers and the bass's change in forage base with the increased abundance of gizzard shad. Crappie fishing should improve if current growth is maintained.

Redear sunfish are supplementing the bluegill fishery as 34% of the redear sampled were greater than 7.0 in. These fish were not found during the 1993 survey because they were either present in low numbers or they were privately stocked after 1993.

Channel catfish fishing pressure is assumed to be high because only five channels were sampled during the survey. The DFW should continue the biennial stockings.

A major problem at Chrisney Lake is excessive sediment loading. Excessive sediment loading is filling in the southern third of the lake where water depths are only 1.0 to 3.0 ft deep. The Town of Chrisney should submit a sediment removal plan to the DFW Lake and River Enhancement Program (LARE). Funding for approved LARE projects is done on a cost-share basis. For questions and more information on submitting LARE proposals, a LARE biologist can be reached at 317-233-1484. Dredging the lake would reduce the risk of a summer fish kill and extend the longevity of the lake.

If the Town of Chrisney does dredge the lake, that would also be the ideal time to conduct a fisheries renovation. A fisheries renovation would entail the DFW applying a fish toxicant to

the lake to kill all the fish. The lake would be restocked with bluegill, largemouth bass, redear sunfish, and channel catfish by the DFW after the renovation. This technique is the only method to eradicate the gizzard shad population besides completely draining the lake. Fishing greatly improves after a renovation because the fish biomass that used to be tied up in gizzard shad is transferred into sport fish production. The DFW would be responsible for all the costs of the renovation and restocking. The lake should not be renovated if it is not dredged due to the high probability of fish kills.

RECOMMENDATIONS

- The district fisheries biologist should provide the city with more largemouth bass minimum length limit signs and inform the Spencer County conservation officer of the perceived harvest of undersized bass.
- The DFW should continue the biennial stocking of 160, 8.0 to 10.0 in channel catfish.
- The Town of Chrisney should submit a sediment removal plan to the DFW LARE biologist.
- A fisheries renovation should be conducted if the lake is dredged.

LITERATURE CITED

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Ball, R.L. and J.N. Tousignant. 1996. The development of an objective rating system to assess bluegill fishing in lakes and ponds. Research report. Indiana Department of Natural Resources. Indianapolis. 18 pp.

Indiana Division of Fish and Wildlife. 2001. Manual of fisheries survey methods. Indiana Department of Natural Resources. Indianapolis. 67 pp.

Pearson, J. 2004. A proposed sampling method to assess occurrence, abundance and distribution of submersed aquatic plants in Indiana lakes. Indiana Department of Natural Resources. Indianapolis. 37 pp.

Submitted by: Daniel P. Carnahan, Fisheries Biologist
Date: January 31, 2006

Approved by: _____
Brian M. Schoenung, Fisheries Supervisor
Date: March 27, 2006

APPENDIX 1